

## CLAIMS

### What is claimed is:

1. A method of calibrating an optical sensor of a color image forming device, said image forming device including a traversing carriage supporting said optical sensor and a plurality of different color ink printheads, the traversing carriage movable over a print area during normal printing operations and over a service area of the image forming device for service operations, the method comprising:

positioning a prefabricated optical sensor target at the service area of the image forming device, the target including a plurality of target patches of predetermined different colors;

moving the carriage to a service area of the image forming device;

acquiring one or more images of said plurality of target patches;

using the one or more images to perform a plurality of calibrations of the optical sensor.

2. The method of Claim 1, wherein said plurality of target patches includes a white patch and a black patch, and wherein said plurality of calibrations includes sensor pixel response uniformity and dynamic range.

3. The method of Claim 1, wherein said plurality of target patches includes a plurality of color patches in the same respective color spectrum as each of the plurality of different color ink printheads, and said plurality of calibrations includes sensor color calibration.

4. The method of Claim 1, wherein said target includes a plurality of spaced fiducial marks, and said plurality of calibrations includes determining an angular position of the target relative to the sensor.

5. The method of Claim 1, wherein said optical sensor includes a linear array of photosensitive pixel elements, and wherein said plurality of target patches includes elongated strips having a longitudinal extent at least as long as a sensor field of view.

6. The method of Claim 5, wherein said elongated strips include a white strip and a plurality of strips of different colors corresponding to the different color ink printheads.

7. A service area module for a color image forming device, said image forming device including a traversing carriage supporting an optical sensor and a plurality of different color ink printheads, the optical sensor including a sensor array and a sensor light source, the traversing carriage movable over a print area during normal printing operations and over a service area of the image forming device for service operations, the service area module comprising:

- a module housing structure positioned at the service area, the housing structure including an elongated target support structure for supporting a planar target surface at a position generally parallel to the sensor array when the carriage is positioned at a first sensor calibration position at the service area;

- a prefabricated target defining said target surface, the target surface including a plurality of target patches of predetermined different colors;

- a mirror surface having a longitudinal extent at least as large as a longitudinal extent of the sensor light source, the mirror surface disposed at an angle relative to the sensor array to deflect light generated by the sensor light source away from the sensor array when the carriage is positioned at a second sensor calibration position at the service area.

8. The module of Claim 7, wherein said module housing structure includes a beveled edge surface, and said mirror surface is defined on said beveled edge surface.

9. The module of Claim 7, further comprising an elongated prism affixed to said module housing structure, and wherein said mirror surface is defined on a surface of said prism.

10. The module of Claim 7, wherein the housing structure has a longitudinal extent at least as long as a field of view of the sensor array.

11. The module of Claim 7, wherein said housing structure defines a channel between opposed side wall surfaces, and said target support structure is defined by a surface of said channel.

12. A service station for an image forming device, said image forming device including a traversing carriage supporting an optical sensor and at least one printhead, the optical sensor including a sensor array, the traversing carriage movable over a print area during normal printing operations and over a service area of the image forming device for service operations, the service station comprising:

- at least one printhead service module disposed at said service area for performing one or more service operations for the at least one printhead during a service;

- a light source disposed adjacent a first side of the service module for generating a light beam over said printhead service module from said first side to an opposed second side of said printhead service module during a drop detecting service procedure;

- a mirror surface disposed adjacent said second side of said printhead service module for reflecting said light beam to said sensor array of said optical sensor when the carriage is positioned at a drop detecting service position at said service area.

13. The station of Claim 12, further comprising a light diffuser disposed in a light path adjacent the mirror surface for diffusing light from said light source.

14. A method of measuring a reference position of a carriage mounted sensor array for an image forming device, said image forming device including a traversing carriage supporting an optical sensor and at least one printhead, the optical sensor including a sensor array, the traversing carriage movable over a print area during normal printing operations and over a service area of the image forming device for service operations, the method comprising:

- moving the carriage to the service area;

- generating a light beam from a carriage-mounted light source at a position adjacent an end of the sensor array, the light beam at an acute angle relative to an array axis;

reflecting the beam from a reference target mounted in the service area at a known position;  
acquiring an image of the reflected beam by the sensor array; and  
using the location of a high intensity area of the image to determine said reference position of the optical sensor.

15. A method of detecting a media type loaded into an image forming system having a carriage mounted optical sensor array, said image forming device including a traversing carriage supporting a printhead and the optical sensor array, the traversing carriage movable over a print area during normal printing operations, the method comprising:

moving the carriage to the print area;  
generating a light beam from a carriage-mounted light source at a position adjacent an end of the sensor array, the light beam at an acute angle relative to an array axis;  
reflecting the beam from the print media;  
acquiring an image of the reflected beam by the sensor array; and  
processing the image to determine said media type.

16. The method of Claim 15, wherein said processing includes:  
processing the image to determine a diffuse image portion and a specular image portion;  
forming a ratio of the diffuse image portion and the specular image portion; and  
determining the image type in dependence on said ratio.

17. In an image forming system which includes a traversing carriage supporting a fluid ejecting device and an on-board optical scanner for movement along a scanning axis, a method for sensing the position of print media borders using the on-board scanner, the method comprising:

with the on-board scanner positioned on the carriage with a scanner sensor array disposed at an angle relative to the scanning axis and at an angle relative to a nominal longitudinal edge of the print media border, moving the carriage at a carriage velocity along the scanning axis over a media border;

acquiring successive images with the scanner sensor at an image acquisition rate; and  
processing each image to find a media border location.

18. The method of Claim 17 wherein said angle is less than 90 degrees.

19. The method of Claim 17, wherein the scanner sensor array is a CCD array.

20. The method of Claim 17, wherein said angle is selected in dependence on said carriage velocity and said image acquisition rate such that at least one image will include an image of the media border.

21. A method for printing with a printing system which includes a traversing carriage supporting a fluid ejecting device and an on-board optical scanner for movement along a scanning axis, the method comprising:

with the on-board scanner positioned on the carriage with a scanner sensor array disposed at an angle relative to the scanning axis and at an angle relative to a nominal longitudinal edge of the print media border, moving the carriage at a carriage velocity along the scanning axis to print successive swaths;

acquiring successive images with the scanner sensor at an image acquisition rate during the swaths;

processing each image to find media border locations and develop a media border profile;

using the profile to extrapolate media edge positions of a next swath;

adjusting the start/stop printing positions in the scanning axis for the next swath.

22. The method of Claim 21 wherein the swaths are printed from one media edge position to the opposite media edge position for each swath.

23. The method of Claim 21 wherein said angle is less than 90 degrees.

24. The method of Claim 21, wherein the scanner sensor array is a CCD array.

25. The method of Claim 21, wherein said angle is selected in dependence on said carriage velocity and said image acquisition rate such that at least one image will include an image of the media border.